



→ Elevate can generate a different type of stairs.

→ Users can immersively feel virtual terrain using Elevate.

# Elevate: A Large-Scale Walkable Pin-Array Display

Current head-mounted displays enable users to explore virtual worlds by simply walking through them (i.e., real-walking VR). This led researchers to create haptic displays that can also simulate different types of elevation shapes. However, existing shape-changing floors are limited by their tabletop scale and the coarse resolution of the terrains they can display due to the limited number of actuators

and low vertical resolution. To tackle this challenge, we introduce Elevate, a dynamic and walkable pin-array floor on which users can experience not only large variations in shapes but also the details of the underlying terrain. Our system achieves this by packing 1200 pins arranged on a 1.80m x 0.60m platform, in which each pin can be actuated to one of 10 height levels (resolution: 15mm/level).

→ <https://makinteract.kaist.ac.kr/project/elevate-2021>

→ <https://www.youtube.com/watch?v=QvuVQ68uf-w>

→ Je, S., Lim, H., Moon, K., Teng, S-Y., Brooks, J., Lopes, P., and Bianchi, A. Elevate: A walkable pin-array for large shape-changing terrains. *Proc. of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, New York, 2021, Article 127, 1–11; <https://doi.org/10.1145/3411764.3445454>

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